

# Swati Jindal

1120 W Olive Ave – Sunnyvale, CA 94086 – USA

📞 +1(831)-239-7682 • ✉ swjindal@ucsc.edu • 🌐 jswati31.github.io

## Research Focus

Computer Vision, Deep Learning and Machine Learning.

## Education

2018–2023 **Ph.D. in Computer Science**, *University of California Santa Cruz, USA*

(Expected) *Advisor: Prof. Roberto Manduchi*

THESIS: EFFICIENT TECHNIQUES FOR TRAINING APPEARANCE-BASED GAZE TRACKERS

2014–2016 **M.Tech in Electrical Engineering**, *Indian Institute of Technology (IIT) Hyderabad, India*

*Advisors: Prof. K Sri Rama Murthy*

2010–2014 **Bachelor of Engg. in Electrical Engineering**, *Panjab University, Chandigarh India*

## Industry Experience

Summer 2023 **Research Intern**, *Google LLC, Mountain View USA*

*Mentor: Yitian Wu, Team: AR Perception*

Summer 2020 **Applied Scientist Intern**, *Amazon.com Inc, Seattle USA*

*Mentors: Jon Wu, Yash Singh, Meng Wang, Team: Rekognition*

Summer 2019 **Applied Scientist Intern**, *Amazon.com Inc, Seattle USA*

*Mentors: Jon Wu, Meng Wang, Team: Rekognition*

July 2016 – **Research Engineer**, *Tata Consultancy Services Research, New Delhi India*

August 2018 *Mentors: Lovekesh Vig, Gautam Shroff*

## Skills

**Languages:** Python, C++, Matlab, R

**Frameworks:** PyTorch, Tensorflow, OpenCV, GIT, Latex, PyCharm, VS Code

## Selected Projects

### Personalized Video Gaze Estimation using Large Language Models (LLMs)

- Proposed deep learning model for video gaze estimation using spatial attention & GPT-based sequence model, addressing challenges like static background and illumination changes.
- Few-shot personalization through Gaussian Processes to handle variations in personal attributes.

### Self-Supervised Learning of Gaze Representations using Multi-View Camera Images

- Developed a contrastive learning framework for gaze estimation that promotes invariance and equivariance through multi-view data and selective data augmentation techniques.
- Proposed to learn equivariant representations using multi-view data collected by multiple cameras; selected for spotlight and won **Best Paper Award** at **NeurIPS 2022 Gaze Meets ML** workshop.

### Controllable Generative AI Model for Gaze and Head Redirection

- Developed a generative adversarial network (GAN) for gaze and head redirection using unsupervised learning and disentanglement of appearance, gaze direction, and head orientation.
- Proposed framework achieves high-quality photo-realistic image generation while completing gaze and head redirection tasks, presented at **WACV 2023** conference.

### Siamese Networks for Few-Shot Chromosome Classification

- Pioneered a few-shot deep learning method that assists medical experts in analyzing human chromosomes from cell images.
- Published in **ICCV Workshop** with 77 Citations.

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## Publications

1. Swati Jindal, Xin Eric Wang, "CUDA-GHR: Controllable Unsupervised Domain Adaptation for Gaze and Head Redirection", Winter Conference on Applications of Computer Vision (**WACV**) 2023, Waikoloa Hawaii.
2. Swati Jindal, R. Manduchi, "Contrastive Representation Learning for Gaze Estimation", Neural Information Processing Systems (**NeurIPS**) Gaze Meets ML Workshop 2022, New Orleans USA (**Best Paper Award** - Spotlight).
3. Swati Jindal, H. Kaur, R. Manduchi, "Tracker/Camera Calibration for Accurate Automatic Gaze Annotation of Images and Videos", ACM Symposium on Eye Tracking Research and Applications (**ETRA**) 2022, Seattle USA.
4. H. Kaur, Swati Jindal, R. Manduchi, "Rethinking Model-Based Gaze Estimation", ACM Symposium on Eye Tracking Research and Applications (**ETRA**) 2022, Seattle USA.
5. Vishwanath D, R. Rahul, G. Sehgal, Swati Jindal, A. Chowdhury, M. Sharma, L. Vig, G. Shroff, A. Srinivasan, "Deep Reader: Information extraction from Document images via relation extraction and Natural Language", Asian Conference on Computer Vision (**ACCV**), IWRR Workshop 2018, Perth Australia.
6. Swati Jindal, M. Sharma, L. Vig, "Automatic Classification of Low-Resolution Chromosomal Images", European Conference on Computer Vision (**ECCV**), BIC Workshop 2018, Germany.
7. Swati Jindal, M. Sharma, L. Vig: "Automatic Chromosome Classification using Deep Attention Based Sequence Learning of Chromosome Bands", International Joint Conference on Neural Networks (**IJCNN**) 2018, Brazil.
8. G. Gupta, Swati Jindal, M. Sharma, L. Vig, "Information Extraction from Hand-marked Industrial Inspection Sheets", International Conference on Document Analysis and Recognition (**ICDAR**), CBDAR Workshop 2017, Kyoto Japan.
9. Swati Jindal, G. Gupta, M. Yadav, M. Sharma, L. Vig: Siamese Networks for Chromosome Classification, International Conference on Computer Vision (**ICCV**) Bio-Image Computing Workshop 2017, Venice Italy.

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## Patents

1. Method and System for Automatic Chromosome Classification (# India - 201821025353)
2. Method and System for Extracting Information from Hand-Marked Industrial Inspection Sheets ( # India - 201721039681, # US - 15938806)

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## Scholarships and Awards

- 2022 Won "Best Paper Award" at NeurIPS Gaze Meets ML workshop.
- 2019 Received UC Dean Fellowship at UCSC (amongst 4 students).
- 2018 Received UC Regent Fellowship at UCSC.
- 2018 Outstanding inventive spirit award for filing multiple patents for TCS Research India.
- 2014 All India Rank 432 - Top 0.2% (amongst 2,16,000) in GATE.
- 2010 All India Rank 8507 - Top 1.2% (amongst 4,70,000) in IIT JEE.

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## Teaching Experience

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### Teaching Assistant

- UCSC Artificial Intelligence, Winter 2023
- Machine Learning, Fall 2022
- Computer Vision, Spring 2020-23
- Universal Access, Fall 2019
- IITH Adaptive Signal Processing, Winter 2016
- Probability and Random Processes, Fall 2015